DOCUMENT RESUME

ED 405 402 UD 031 460

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TITLE High School Employment: Meaningful Connections for At-Risk Youth.
INSTITUTION Urban Inst., Washington, D.C.
PUB DATE 12 Apr 96
NOTE 50p.; Paper presented at the Annual Meeting of the American Educational Research Association (New York, NY, April 8-12, 1996).
PUB TYPE Reports - Evaluative/Feasibility (142) -- Speeches/Conference Papers (150)

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS College Bound Students; Dropouts; Educational Attainment; *Education Work Relationship; High Risk Students; High Schools; *High School Students; *Income; Literature Reviews; Outcomes of Education; *Part Time Employment; Racial Differences; *Student Employment

ABSTRACT

Benefits and drawbacks to the employment of high school students were studied using data from the High School and Beyond Survey (HS&B). A literature review was followed by an analysis that used final samples of between 6,000 and 10,000 HS&B students depending on the regression performed. These students were sophomores in 1980 and were resurveyed 2, 4, 6, and 12 years later. The analysis suggests that working a moderate number of hours a week (15 to 29) as a sophomore in high school can be particularly beneficial for the employment and earnings of at-risk youth even 10 years after finishing high school. On the other hand, working a moderate to high number of hours increases chances of dropping out and lowers college enrollment by even more. Analysis suggests that the future earnings of those who did not work in high school might come to surpass earnings of those who did. Policy implications of the results are discussed, and the measure of "at-risk" that is used is described because it summarizes the factors likely to affect economic attainment later in life better than race or poverty status, which have been used in other research. (Contains 5 figures, 9 tables and 14 references.) (SLD)

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High School Employment: Meaningful Connections for At-Risk Youth

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April 12, 1996

Presented at the 1996 annual meetings of the American Educational Research Association in New York City. An earlier version of this paper was presented at the 1995 annual meetings of the Association for Public Policy Analysis and Management in Washington, D.C. Comments by Rob Meyer were helpful and support from the Spencer Foundation is gratefully acknowledged. The opinions expressed in the paper are those of the authors and do not necessarily reflect the views of the sponsor or The Urban Institute. The authors wish to thank Julie O'Brian for expert research assistance. Direct correspondence to: Jane Hannaway, The Urban Institute, 2100 M Street, NW, Washington, D. C. 20037; ph- 202/857-8753.
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I. INTRODUCTION

Employment during high school is increasingly common among youth and recent government policies, notably school-to-work programs, are further promoting employment for high school students. What are the advantages and drawbacks for youth who are working while in school? Should we be encouraging it? How does it affect individuals' decisions regarding investments in education? Do effects persist for the long term? Does employment affect all youth similarly? This paper seeks to answer these questions by examining some of the short and long term costs and benefits of high school employment for youth using the High School and Beyond data. One of our primary interests is examining whether the effects of working while in school differ for different types of students, particularly 'at-risk' students.

This paper extends earlier research on this topic in three ways. First, we focus primarily on youth who are clearly at risk of long term employment problems. Previous studies have focused on race differences. We argue that the at-risk status of students determined by school and family characteristics may be more relevant, because families and schools represent the two societal institutions most responsible for promoting social and economic mobility. Second, we examine long term outcomes that incorporate both employment and educational effects. Other studies have tended to focus on one or the other. Third, we examine the possibility of selection bias more extensively than most previous studies. While we find no evidence of a selection bias, we cannot completely rule it out.

We find evidence of large and significant[1] later earnings benefits to high school work for at-risk youth, in spite of substantial short term educational costs. And while there are also benefits for not at-risk youth, they are not as large. We suspect the reason high school employment is more important for at-risk youth is that work provides them a structured environment with clear rewards

and support not available to them in other aspects of their lives. In addition, employment establishes connections to the work world that their school experiences and families may be less able to provide.

Policy Background

Policy interest in the effects of high school employment has increased in recent years for a number of reasons. First, the fraction of high school students engaged in part-time employment has climbed dramatically over the last twenty years. Recent estimates indicate that over two-fifths (42.8%) of high school students between 16 and 19 engage in some form of employment while enrolled in school (Wright and Carr, 1995; U. S. Bureau of the Census, 1991). These high rates of participation give rise to questions about whether this is a good way for students to spend their time, especially since youth in other countries are far less likely to be employed while in school (Greenberger and Steinberg, 1986).

Second, the transition from school to work for non-college bound youth is considered problematic in the United States where formal linkages between schools and employers have traditionally been weak (Commission on the Skills of the American Workforce, 1990; Rosenbaum, Kariya, Setterson and Maier, 1990). We estimate the benefits of high school employment for students who make early connections with employers on their own.

Third, recent federal and state programs foster improved school-work connections for youth. Several states, for example, have enacted laws that establish ways for high school students to engage in work-based training. At the federal level, in 1994 President Clinton signed into law the *School-to-Work Opportunities Act*, providing federal support for states to develop school and work linkages for non-college bound youth. As yet, there have been no systematic evaluations of these efforts, but

our study of the effects of high school employment may provide some early indication of the likely consequences of these programs for different student populations.

High School Work and At-Risk Youth: Conceptual Overview

Three general mechanisms underlie most social mobility processes in modern society: family, school and work. The importance of family background and family connections for getting ahead, for example, is well known. There is also a large literature in sociology of education which shows the role that schools, and success in school, plays in upward mobility. A third way for individuals to move up is through employment. In this study we are primarily interested in the role that working during high school plays in establishing youth in the labor market. We suspect that, for youth without effective family or school sponsorship of their progress, early connections with work may be particularly consequential.

Employment during high school holds a number of potential advantages for facilitating school to work transitions over the usual alternatives, such as vocational education. While these advantages would apply to all students, they may be especially important for at-risk students for reasons we discuss below.

One clear advantage of high school work is that it helps youth establish connections with future employers. One possibility, of course, is that the employer of a high school student would offer the youth later employment. But even if a particular employer has no openings, the connection might open doors to other employers. Apart from any skills gained through high school work, just having worked might itself signal to employers that the youth is a "worker". Such a signal may be particularly important for at-risk youth whose other characteristics may leave employers uncertain

about their value. Certainly having a recommendation from a former employer can carry considerable weight when one is looking for a job, since former employers, unlike teachers, have observed the youth in real work situations. In the case of at-risk youth, alternative linkages to employers such as through family connections - the way a large fraction of youth find jobs - are likely weak, as we have mentioned. And most high schools are generally more geared to providing connections to posts-econdary educational institutions than directly to employers.

Employment also has an advantage because it pays youth and thereby may promote a taste for earning income which could motivate interest in a continued connection to the labor market. In addition, immediate monetary rewards might better focus youth on productive activity than, say, classes which typically rely on the prospect of future rewards. For at-risk youth, many of whom may face the temptation of turning to crime for economic reasons, establishing these tastes early may be particularly important.

There could also be a number of efficiency advantages to high school employment. Success in the work world, for example, requires disciplined work habits. It is possible that these habits are transmitted more effectively in the workplace rather than schools. High school employment may also be more efficient, since work habits learned on the job are a relatively costless by-product of doing one's work. In addition, employers generally have a clear monetary incentive to see that youth exhibit productive and appropriate work behaviors; incentives in schools are less clear.

High school employment also has disadvantages, the most obvious of which is that it may curtail human capital investment by encouraging youth to drop out of school and discouraging future schooling. Reduced education is likely to lead to lower future wages and/or limited occupational mobility and thereby offset any benefits of increased work experience. This effect may be

particularly pronounced for at-risk students who are unlikely to be strongly attached to school anyway.

The remainder of this paper is organized as follows. In the next section, we review previous literature in this field. Section three describes the data used to conduct our analysis and reports descriptive statistics. We discuss our econometric models and the variables used in the empirical analysis in the fourth section. In the final two sections, we present our results and summarize our findings while giving suggestions for future research.

II. LITERATURE REVIEW

A number of studies have looked at the effect of work in high school. Some have focused on later employment outcomes and others on educational outcomes.

Studies examining effects on later employment have, for the most part, concluded that high school employment has beneficial effects for youth. In a 1982 study, using the National Longitudinal Study of the High School Class of 1972, Meyer and Wise found a strong association between hours worked in high school and wages and weeks worked four years later (Meyer and Wise, 1982). In a later study, using the same data, they examined whether the effects of high school employment on black youth and white youth were the same and found similarly significant results for both groups (Meyer and Wise, 1984). Wright and Carr (1995), using data from the National Longitudinal Survey, Youth Supplement (NLSY), estimate effects of high school employment twelve years later. They claim that the employment benefits (employment and earnings) of high school work persist; the shorter term gains noted by other analysts do not disappear over time. Ruhm (1995), also using NLSY, analyzes the long term (6-9 years) employment effects of working

while a senior in high school and finds similar results.

The picture, of course, is a complicated one because working in high school is also likely to have costs in terms of educational attainment and, thus, long term career prospects (Steinberg, 1982; Steinberg et al., 1982a). Studies of educational effects of high school employment have generally focused on estimating possibly different effects for different numbers of hours worked in high school. In general, they found that low levels of work had either a beneficial (D'Amico, 1984; McNeal, 1995) or no clear effect (Barro, 1984), but that intensive employment contributed to dropping out of school (D'Amico, 1984; Sternberg et al, 1984; Barro, 1984; McNeal, 1995).[2] Turner (1995) also estimated negative effects of extensive work experience on a number of different measures of academic achievement, including high school completion, in single-equation models; but he found insignificant estimates when he attempted to control for selection using a two-stage model.

Few studies have focused on differential impacts of working on different types of students; for those which have, the results are mixed. Meyer and Wise (1984), mentioned above, compared effects for black and white male high school graduates and found similar effects of employment. Steel (1991) also estimated separate effects of high school employment on enrollment and employment two years later with NLSY data and found differences by race. Working a moderate amount of hours in high school was positively associated with subsequent educational enrollment for white youth; the opposite result was found for black youth. And while high school employment enhanced the later employment of white youth, it did not for black youth. More recently, Foster (1995), using information on brother pairs from the Panel Study of Income Dynamics (PSID), claims that the long term effects of working in high school may be negative for poor black youth,

although the large standard errors associated with his results make his conclusions suspect.

This study attempts to extend the literature on high school employment in three ways. First, it focuses primarily on long term earnings effects. The most recent available HS&B survey, administered in 1992, allows us to follow students from their sophomore year in high school through the next twelve years. With the exception of the recent work of Wright and Carr (1995) and Ruhm (1995), who used NLSY, and Foster (1995), who used the PSID, most studies have estimated effects for the first few years out of high school. A critical policy question is the extent to which the early benefits to high school employment, found by others, endure in the long term.

Second, we develop models which allow us to estimate the possible benefits of high school employment simultaneously with the possible costs in terms of schooling. Meyer and Wise (1982; 1984), for example, only include high school graduates in their analyses. By ignoring the likely effect of high school employment on dropping out of school, they may overestimate its benefits on later employment. Wright and Carr (1995) incorporate educational attainment indicators in their models and, therefore, also miss possible negative effects on earning which occur through educational attainment. Our models capture direct effects of high school work on later employment and earnings as well as any effects through education.

Third, we focus on identifying possibly differential effects on at-risk youth. Previous research, which focused on sub-groups of students, has largely been confined to differences by race. We construct a measure of at-risk status which is theoretically relevant to the outcomes of interest. That is, we identify 'at-risk' students as those who are unlikely to get much direction for their future from their families or their schools, regardless of race. For these youth, we suspect high school employment may be particularly important, precisely because alternative ways to establish

connections with the labor market - through family and/ or school - are more restricted.

III. DATA AND DESCRIPTIVE STATISTICS

The Data

We use data from the sophomore cohort of the High School and Beyond (HS&B) survey, collected by the National Center for Education Statistics (NCES). The HS&B survey oversampled black and Hispanic youth, but provides nationally representative samples when appropriately weighted. The survey began with a sample of more than 28,000 high school sophomores in 1980 and resurveyed the same individuals 2, 4, 6, and 12 years later. The data were collected by NCES in order to help researchers analyze students' high school experiences and transitions to post-secondary education and work.

We focus our analysis on those individuals who were in public school in 1980 and completed all surveys. HS&B includes data on 28,240 sophomores in 1980. More than 14,000 respondents were dropped from the sample after the first follow-up survey. An additional 3,100 students in public schools were left out of our analysis, leaving around 11,000 cases.[3] Finally, we drop cases because of missing values of either the dependent variable in a regression (earnings, employment, or school enrollment after 1980) or our independent variable of interest (hours worked in 1980). When we control for years of completed education or current family status (living with spouse, partner, and/or children) additional cases are dropped if they are missing information on these variables. Missing values of other variables are substituted with the means.[4] Our final samples include between 6,000 and 10,000 students depending on the regression.

The Variables

Table 1 reports descriptive statistics on each of these variables as well as on the control variables used in the analysis.

At-risk status - Conceptually, we are interested in youth who are unlikely to have high levels of sponsorship in gaining employment from their families, their immediate community, or their school. Among youth for which support from all these backers is likely to be low, we suspect early employment is likely to be important for later success in the labor market. Thus, at-risk youth are those whose measures of family SES (BYSES)[5] and composite test scores (BYTEST) are below average for our HS&B sample, and whose parents are reportedly not likely to be heavily involved in overseeing their activities.[6] Applying these criteria yields an at-risk population which represents 16 percent of the sample. As can be seen the SES, test performance and parent involvement of the at-risk group is substantially lower than that of the not at-risk group.

Table 2 shows the SES, Test and Parent Involvement measures for at-risk and not at-risk youth. We show the percentage of the group whose SES measure is lower than the 30th percentile and lower than the 15th percentile in our HS&B sample. We report Test in the same way. The mean Parent Involvement measure[7] for each group is also reported.

Hours Worked in High School - Youth reported the number of hours they worked "for pay last week" (BB019) in 1980 when they were sophomores. We categorize hours into four discrete categories: '0', '1-14', '15-29' and '30 or more'.[8] Table 3 shows the distribution of hours worked for at-risk and not at-risk youth. As can be seen, the distributions are very similar. In both groups, about 40 percent of students work for pay at some level, a level similar to that reported in the last census (U.S. Census, 1991).

School Enrollment - We define school enrollment quite broadly. We consider an individual as enrolled in school if they are taking any courses at a college, any vocational or technical courses, or if they are in any apprenticeship or government training program. We construct this measure for each wave of the survey (FD1B/D, FUSTTYPE, SY3B/D, TY3B/D, Y4103D/F).

Employment - Employment includes military service as well as regular employment, but excludes those on temporary layoff or waiting to report to work. We focus our analysis on behavior for the week before the survey since this information is likely to be reported most accurately by respondents. We construct this measure for each wave of the survey (FD1A/C, FY22, SY3A/C, TY3A/C, Y4103A/C).

Earnings - Earnings information comes from questions asked directly in 1992 for total annual earnings for each year from 1983 through 1991 (Y4301B1 - Y4301B9).[9] In Table 1, we present the mean earnings for the at-risk and not at-risk groups for 1988 to 1991, which is the measure used in most of our analyses.

Control variables - Of particular interest among the control variables is race. Note that 25

percent of the at-risk group is black, as is 13 percent of the not at-risk group. This suggests that defining groups by theoretically relevant factors, rather than dividing them simply by race, as previous research has tended to do, is likely to yield a very different subsample.

Descriptive Results

The descriptive results presented in this section control only for the at-risk status of the youth. They are based on linear regressions of each outcome on hours worked in high school interacted with at-risk status, and preview the findings to be presented later.

Figure 1 presents information on the relationship between hours worked in high school and later annual earnings for both at-risk youth and those not at-risk. Our outcome variable is average annual earnings from 1988 to 1991 including zeros for non-earners. The figure suggests that all youth benefit from working at least a moderate amount in high school.[10] In addition Figure 1 suggests that at-risk youth benefit more in terms of earnings than youth who are not at-risk, as we hypothesized.

Table 5 presents similar numbers on two-year averages of earnings from 1984 to 1991. The at-risk youth benefit from working in each of these years and the benefits remain large and substantial in the final period (1990-1991). The second panel of Table 5 shows that moderate and high hours of work in high school are associated with significantly lower probabilities of earning less than $10,000 per year.

Figure 2 shows the relationship between hours worked in high school and school enrollment and employment two years later. Three observations are worth noting. First, at-risk youth are both less likely to be in school and less likely to work, conditional on hours worked in 1980. Second, the school enrollment graphs in Figure 2 suggest that there are costs in terms of education for all students working intensive hours, but they appear to be particularly pronounced for those at-risk.

Third, the results in the bottom two graphs suggest that, for both groups of youth, there are benefits in terms of later employment for working more hours in high school.

These results are analyzed more closely in Section V using multivariate models, which take into account other factors possibly affecting results, and a recursive model which attempts to control for selection bias.

IV. MODEL SPECIFICATION

In this section, we provide rationale for our regression models and describe our econometric specification.

Motivation for Model

While our descriptive statistics are compelling, they provide weak causal evidence because there exists a large number of other factors associated with working more in high school and working more later in life. The descriptive results summarized in Section III implicitly assume that youth who work, and those who do not work, are alike on all other relevant factors. This is, of course, a big assumption. For this reason, we provide evidence based on a multivariate analysis that takes into account the numerous control variables identified in Table 1 earlier. Like most research in this area, however, we face the possibility of selection bias. While we attempt to deal with this problem in ways described below, we cannot completely rule out a selection explanation for our findings. In spite of this weakness, we feel the findings are stark enough to make them a worthwhile contribution to the body of literature attempting to inform policy initiatives associated with linking youth with jobs.

We are primarily interested in evaluating the overall effects of employment in high school

on later outcomes. High school employment can affect later outcomes in a number of ways. In short, by increasing an individual's work experience, high school employment can increase both their attractiveness to employers and their taste for work. On the other hand, by decreasing school enrollment, high school employment may decrease human capital accumulation and later wage offers. It would be interesting to model all of these related processes. However, we choose instead to focus on overall effects, without controlling for the intermediate factors such as completed years of education, employment experience, or wage offers.[11]

Two of our main outcomes of interest, school enrollment and employment, are discrete outcomes. For this reason we use Multinomial Logit (MNL) Models to analyze these outcomes. In order to make our results comparable to those presented in Figure 2, we calculate derivatives of the probabilities of school enrollment and employment based on the results of the discrete choice models.

Econometric Model

Multinomial Logit Model. We assume that each individual i chooses among 4 employment/school enrollment options and that the utility[12] of choice n (V_{in}) is a linear function of work experience in high school (Z_{in}), the control variables (X_i), and a random component (e_{in}),

$$(1) \qquad V_{in} = Z_i'\beta_{Zn} + X_i'\beta_{Xn} + e_{in},$$

where β_{Zn} and β_{Xn} are vectors of parameters. Note that the parameters (β_{zn} and β_{Xn}) are allowed to vary across choices.

The individual is assumed to choose the option that yields the highest utility. Option j will

be chosen by i if,

(2) $V_{ij} >= V_{in}$, n=1,....N.

We assume that the random components (e_{in}) are independent across individuals and modes of care. We also assume that each random component is drawn from the extreme value type I distribution. Given these assumptions, the probability that option j is chosen by individual i may be written as

(3) $p_{ij} = \text{Prob}(V_{ij} >= V_{in}, n=1,..N) =$

$$\exp(Z_i'\beta_{Zj} + X_i'\beta_{Xj}) / \sum_{n=1}^{N} [\exp(Z_i'\beta_{Zn} + X_i'\beta_{Xn})].$$

For identification, the parameters of the control variables are normalized to 0 for the first choice. The remaining parameters of the model are estimated using maximum likelihood.[13] To estimate this model we must assume that unobserved attributes of each mode are independently distributed. This assumption is often described as the Independence of Irrelevant Alternatives (IIA), to refer to the fact that utility is not affected by characteristics of other modes. In future work we plan to test the IIA assumption using methods suggested by Hausman and McFadden (1984).

Derivatives. In order to summarize our results and make them comparable to those presented in 5 we calculate derivatives of the probabilities of school enrollment (with and without work), employment outside of school, and total activity (employment or school enrollment). We find these numbers easier to interpret that the coefficient estimates from the multinomial logit models.[14] Many analysts use simulations to calculate such numbers. The advantage of our method is that we can calculate standard errors for our results.[15]

Omitted Variable Bias. A final issue in our analysis is that even after controlling for the

observed variables in our analysis, it is possible that employment in high school and later outcomes are strongly affected by unobserved factors. These unobserved factors may cause a strong association between these variables which does not represent a causal effect. In other words they may cause our estimates of causal effects to be biased. One method of estimating effects that are not biased by unobserved factors is to use instrumental variables. Unfortunately it is not clear what variables could serve as appropriate instruments in our analysis. We considered using the unemployment rate in 1980 to instrument employment in that year. As expected, unemployment in 1980 does have a large effect on employment in that year, and appears to have similar associations with outcomes in later years. This would suggest that employment has positive effects. However it is very likely that unemployment in 1980 is highly correlated with unemployment in later years. Since we did not have data on unemployment after 1982 we were not able to estimate models for our later outcomes. For 1982 our results had very large standard errors, suggesting unclear effects of employment in 1980 on outcomes in 1982.

A second problem with using the unemployment rates alone to instrument employment is that we are interested in not only the effect of whether or not someone is employed in high school, but also the differential effects of different levels of employment. While 1980 unemployment is a good predictor of whether or not a teen is employed in 1980, it is not as useful for predicting the level of employment. Therefore using unemployment rates to instrument employment tells us little about whether or not moderate employment is most beneficial on later outcomes.

Log Earnings. In our regressions we use the logarithm of earnings because many analysts find that the log function better approximates the relationship between earnings and observable covariates. In addition, small parameter estimates are approximately equal to the percent change

in earnings associated with a one unit change in the covariate. A disadvantage of using the log of earnings is that the log of 0 is minus infinity. Therefore it is not clear how to handle people with zero earnings. In our sample about 16 percent of the at-risk youth and 9 percent of the advantaged youth have zero earnings each year. To get around this problem we use the log of average earnings from 1988 through 1991 and omit cases with zero earnings in all 4 years, about than six percent of our sample. In separate regressions, we analyze how employment in high school affects the probability of having zero earnings.[16]

Control Variables. We control for a large number of observable factors which are likely to affect both employment in high school and later outcomes. Many of these variables had numerous missing values. We substituted missing values with the mean value of the missing variable and created indicator variables indicating that the original value was missing. Including these missing value indicator variables had very little effect on our results, as discussed in Appendix A.

V. RESULTS

In this section we describe the results of our multivariate analyses.

Employment and School Enrollment -- Figures 3 and 4 and Table 4 present the results of our multinomial logit models. As discussed earlier, we present the derivatives of probabilities rather than the coefficient estimates themselves. These derivatives represent the percent change associated with working as compared to not working. Interestingly, the results are very similar when we estimate linear probability models (ordinary least squares) for each outcome (school enrollment and employment) separately.[17]

Our control variables include information on the student's academic characteristics (grades before 10th grade, test scores, 10th grade academic track, and if held back before 10th grade), demographic characteristics (age, gender, and ethnicity), background (religiosity, handicap status), parental characteristics (socio-economic characteristics, family structure, education, involvement, and language), and high school characteristics in 10th grade (percents disadvantaged, going to college, and non-white).

In Figure 3 and in the first panel of Table 4, we show that working in high school is strongly associated with higher employment in 1982, even after controlling for the large number of important factors mentioned above. In addition, in Figure 4 and in the second panel of Table 4 we show the negative effects of working over 14 hours per week in 1980 on school enrollment in 1982.[18] These results hold true for both 'at-risk' and 'not at-risk' youth, and are similar to the estimated effects suggested by our descriptive statistics in Figure 1 and results reported in other literature (e.g. Meyer and Wise, 1982, 1984; McNeal, 1995).

Over time these effects decline substantially but even in 1992 we still find positive effects of work in high school on employment for 'at-risk' youth. For 'not at-risk' youth working over 14 hours per week the estimated effects are significantly smaller and only the effect of working moderate hours is significant at the 10 percent level. The results for 1992 also conform with the estimated effects of work on earnings in Figure 1 and Table 5 which suggested that working in high school increases earnings later in life, especially for the 'at-risk' youth.

While estimated effects on later employment are large and positive, the estimated effects on school enrollment are large and negative in 1982 and become even larger in 1984 when many youth enter college. Other research has documented the effects of work in high school on dropping out

(McNeal, 1995). Our results suggest even larger effects of working on post-secondary school attendance.

By 1986 the estimated effects on school enrollment are substantially less negative and in 1992 we actually estimate a positive effect of working over 29 hours per week on school enrollment for 'at-risk' youth. This may reflect a pattern of going back to school to make up for lower enrollment in earlier years.

Average Earnings from 1988 to 1991 -- The results from Table 4 suggest that employment in high school has positive effects on later employment and generally negative effects on later school enrollment. Therefore it is not clear what the net effect on earnings is, especially 8 years later when most youth have finished school. In Table 6 we present the estimated effects of working in high school on the log of annual average earnings from 1988 to 1991 for those with positive earnings in any year. We use the log of earnings to help account for the fact that an equal change in earnings will represent a much larger percent of total earnings for 'at-risk' youth than for 'not at-risk' youth.[19]

Figure 5 and Table 6 show that the estimated benefits of working are largest for 'at-risk' youth working moderate hours. 'Not at-risk' youth also benefit from working moderate hours, but by far less.[20] The estimated benefits of working heavy hours are smaller, but also less clear because of large standard errors.[21]

Using the log of earnings means that we have ignored non- earners, about 6 percent of our sample. In the second panel of Figure 5 and Table 6 we present the estimated effects of working in high school on the probability of having 0 earnings for all of 1988 through 1992. While moderate work does not appear to have large effects on this outcome, high hours of work in high school are

associated with a much lower probability of zero earnings for 'at-risk' youth. To summarize for 'at-risk' youth, high hours of work in high school appear to increase the chances of having positive earnings later in life while moderate hours increase earnings among the earners.

The models used to estimate the results in Table 6 do not control for current family status of the youth or years of educational attainment because these outcomes are likely to be endogenous. Rather than estimate effects controlling for these outcomes we were more interested in the "total" effects of high school employment on later earnings. However, it can be argued that these factors help to control for unobserved factors that affect both work in high school and later earnings. Therefore in results not presented here we controlled for these factors.[22] The results with these extra controls changed little and continued to suggest large and significant effects of moderate and heavy work in high school on the later earnings of 'at-risk' youth.

While most youth had finished school by 1988, some were still attending. Therefore we estimated our earnings regression excluding individuals who attended school at any time from 1988 to 1991. The estimated effect of moderate work on later earnings for 'at-risk' youth changes very little and remains significant.

Many individuals leave the labor force to spend time in activities that do not relate to child-rearing or education but that are generally considered productive and socially acceptable. These activities include home-making, caring for friends and relatives, volunteer work and extended vacations. In addition individuals may care more about earnings after completing their final degree than earnings earlier in their lives. Therefore we estimated models using the log of average annual earnings two years after finishing the highest degree, excluding all individuals who were out of the labor force at any time during the year. In these models we controlled for the student, family,

school, characteristics used in Table 4. The estimated effect of working moderate hours for 'at-risk' youth changed very little while the estimated effects of working little and high hours increased substantially and became significant at the 5 percent level. These results did not change noticeably when we added controls for completed educational attainment and current family status. The 'not at-risk' youth had less positive effects but only the interaction with low hours was significant.

Finally, we considered alternative specifications similar to those of Foster (1995) and Steel (1991). When we estimate the effect of work in 1980 versus not working, without differentiating by hours of work, we still estimate positive and significant effects for 'at-risk' youth, but none for 'not at-risk' youth. However, when we change our definition of being 'at-risk' to being poor (SES less than 50th percentile) and black, we find no significant effects.[23]

We also do not find the interactions between race and hours worked in high school on outcomes two years later which are reported by Steel (1991). Using the HS&B data and the controls for student, family, and school characteristics used in Table 4 we find that working more than 14 hours per week as a sophomore is associated with much lower school enrollment 2 years later for both blacks and non-blacks. Working less than 14 hours per week lowers enrollment for blacks but not for non-blacks. A separate probit regression suggested strong effects of 1980 work on employment in 1982 for both blacks and non-blacks with no significant interactions between hours worked and race. The differences between our results may be due to the fact that Steel looks at somewhat different outcomes and hours of work later in high school. In particular Steel analyzes employment in the Junior or Senior year of high school on continuous measures of employment and school enrollment two years later. In addition Steel uses NLSY data instead of HS&B. Finally, however, we note that none of the interactions between race and hours worked in high school

reported by Steel (1991) are statistically significant based on the reported standard errors.

These results, suggests that the focus on race common in this literature may be somewhat misplaced.[24] In addition, these results may help to explain why Foster (1995) finds insignificant effects of work in high school on later outcomes for poor blacks. Indeed his standard errors are larger than many of our estimated effects.[25]

All of these results suggest that between the ages of 25 and 28 'at-risk' youth (using our definition) who worked moderate to heavy hours in high school are likely to be earning more than their non-working counterparts. However, because of the negative effects on school enrollment noted earlier, it is not clear whether these earnings benefits would continue to persist in the future. Indeed, if the non-workers spend more time developing their human capital, these earnings differences could easily be reversed in future years. To address this issue we look at educational attainment and earnings growth.

Educational Attainment -- Table 7 presents results from logit regressions for completing an associates or bachelors degree and for completing high school by 1992. These regressions control for the student, parent, and school characteristics which were used as controls in Table 4. While many of the coefficient estimates are negative, suggesting that higher employment in high school may lower educational attainment, none is statistically significant.[26] Only the interaction of being 'at-risk' and working over 29 hours per week lowers the probability of finishing high school. While it is tempting to describe these results as, "no evidence of negative effects," we feel a more informative summary is that we have large standard errors. For instance, we cannot reject the possibility that working moderate hours lowers the probability of finishing high school by 11 percentage points and the probability of obtaining an AA or BA degree by 20 percentage points.

Our results from Table 4 suggest that, at the very least work, in high school delays education by lowering school enrollment two and four years after the youth are sophomores in high school. Evidence supporting this is that in regressions not presented here we found large and significant effects of working low or high hours in high school on the probability of having a Graduation Equivalency Degree (GED) at the time of the 2nd follow-up survey.[27] To summarize, while we have unclear information about the effect of work in high school on completed education in 1992, it is clear that work in high school is associated with delaying of educational attainment.

Earnings Growth -- While evidence on earnings 10 years out of high school is compelling, later earnings may change substantially. As discussed above those with more work experience also have lower educational attainment. In addition, they may have received less training on the job. Both of these factors may cause their earnings to increase more slowly than those with less high school employment experience but more human capital development. To investigate this possibility Table 8 presents a regression of the change in earnings from 1988 to 1991 on the work variables and controls used in Table 6. We find no evidence that work in high school lowers the earnings trajectory.

To summarize, we feel that these results suggest it is unlikely that for 'at-risk' youth, the non-workers will be making more than the moderate workers soon after age 28. At the very least we can reject the possibility that the 1980 non-workers would catch up with 1980 moderate hour workers in less than 4 years.[28]

Selection Bias -- As mentioned earlier, it is possible that the association between hours worked in high school and later outcomes is driven largely by factors not controlled for in our

regressions. For instance, individuals who work many hours in high school may be particularly self-motivated and independent. In other words, their earnings may have been higher than those of their non-working counterparts regardless of what their early employment and schooling experiences were. To test for this possibility we attempted to estimate a recursive model in which the effect of work in 1980 on employment in 1982 as identified by the unemployment rate in 1980. More precisely, we estimate a recursive bivariate probit model[29] with work in 1980 and employment in 1982 as the dependent variables. The model is recursive because 1980 work is a right hand side variable in the 1982 employment equation.

In order to identify the effect of work in 1980 on employment in 1982 we assume that the unemployment rate in 1980 affects only the former. The model is described by the following set of equations:

Propensity to Work in 1980.

1) $W80^*_i = X_i'B80 + UN80_i*G80 + Ew80_i$

Work in 1980.

2) $W80_i = 1$ if $W80^*_i > 0$ and 0 otherwise.

Propensity to be Employed in 1982.

3) $E82^*_i = X_i'B82 + W80_i*A82 + UN82_i*G82 + Ew82_i$

Employment in 1982.

4) $E82_i = 1$ if $E82^*_i > 0$ and 0 otherwise

In these equations X_i represents the student, family, and school characteristics of individual i which are controlled for in Table 4, UN80 and UN82 are the country unemployment rates in 1980

and 1982, B80, B82, G80, G82, and A82 are parameters to be estimated, and Ew80 and Ew82 are distributed standard bivariate normal independently of X, UN80 and UN82.

Results of interest from this regression are presented in Table 9. They show that while the 1980 unemployment rate does have a negative and significant effect on working in 1980, our estimated effect of work in 1980 on employment in 1982 is estimated very imprecisely.[30] In other words we cannot differentiate between the effects of unobserved factors and the effect of work in 1980 using only 1980 unemployment as the instrument.[31]

A second test for selection can be derived from the assumptions of our recursive model. That is, we would expect workers from counties with high unemployment rates in 1980 to be more select than the workers from areas with lower unemployment rates. The workers in the high unemployment rate areas are the chosen few; the workers in the low unemployment rate areas include represent wider and presumably less discriminate selection. The more select workers should be more likely to work in 1982 than the workers from the low unemployment rate areas, even after controlling for the other variables in our model. We tested for this possibility by estimating a probit model of employment in 1982 on work in 1980, the unemployment rates in 1980 and 1982, work in 1980 interacted with the unemployment rate in 1980, and our standard controls. The interaction of work in 1980 with the unemployment rate in 1980 was positive and significant at the 10 percent level suggesting some weak evidence for selection. An alternative explanation for this finding is that 1980 workers from high unemployment rate areas developed a better appreciation for work because it was scarce.

A related test for selection is based on a similar selection argument for the non-workers. Non-workers from counties with low unemployment rates (high labor demand) should be less work

prone than non-workers in areas with high unemployment rates (low labor demand). Therefore to the extent that unobserved factors affect who works, even after controlling for our observed variables, we would expect the unemployment rate in 1980 to also have a positive effect on working in 1982 for the non-workers. We find no evidence of this based on our results in Table 9 since the coefficient on the 1980 unemployment interacted with not working in the second panel is negative and not significant. To summarize, while we find little evidence of selection, we have large standard errors in our recursive model, suggesting that large biases on our estimated effects of work in high school are possible.

VI. Conclusions

Our analysis suggests that working a moderate number of hours (15 to 29 per week) as a sophomore in high school can be particularly beneficial for the employment and earnings of 'at-risk' youth even 10 years after finishing high school. A simple analysis of descriptive statistics suggests this possibility, and our results hold up when we control for a large number of student, family, and school characteristics.

On the other hand, we also find evidence that working a moderate to high number of hours in high school increases dropping out of high school and lowers college enrollment by even more. This suggests that in future years earnings of those who did not work in high school might overtake those 'at-risk' youth who did chose to work. We analyzed this possibility by looking at the change in earnings from 9 to 12 years after the initial survey and find evidence that the non-workers are unlikely to catch up with those who worked moderate hours in less than 4 years. Indeed our point estimates suggested an increasing rather than decreasing earnings gap.

A particular strength of this paper is that we develop a measure of 'at-risk' that we believe better summarizes the factors likely to affect economic attainment later in life than race or poverty status, which have typically been used in other research. When we estimate models using the alternative measures of 'at-risk' we find, as expected, much weaker results.

While our evidence is not proof of causality, we do believe it is compelling. We find that for the 16 percent of youth who are 'at-risk', moderate work in high school is associated with higher earnings at age 25-28 and probably higher earnings for some years after that in spite of delayed educational attainment. In other words, even though working is associated with higher chances of dropping out, it is also associated with higher earnings as a young adult for 'at-risk' youth.

The results have strong policy implications. In short, they provide support for programs designed to facilitate the transition from school to work by encouraging youth to work in high school. While dropping out should be strongly discouraged[32], it appears that working in high school is likely to benefit the youth in the long run, in spite of its effect on schooling.

Appendix A

Controlling for Missing Values of Control Variables

Many of our control variables had missing values. We substituted the means for these variables and then created indicator variables indicating that the original value was missing. Unfortunately we were not able to include these missing value indicators in our MNL regressions because of limits in the LIMDEP software we were using. The package only saves a variance matrix for the first 100 coefficient estimates. Since we have 4 outcomes we have 3 parameters for each variable of interest, and therefore we were limited to 33 variables. However, we were able to test our results in the following way. The derivatives presented in Table 4 are very similar to the results of linear regressions of the outcomes on the same set of variables. Using linear regressions we were able to calculate our results with and without the missing value indicator variables. Adding the missing value indicators changed the coefficients on the work variables in the linear regressions very little.

ENDNOTES

1. Significant refers to statistical significance at the 5 percent level throughout unless otherwise specified.

2. For Barro (1984), 0-14 hours constituted low levels of work and greater than 15 hours represents high levels. D'Amico found that students who worked more than 20 hours a week were more likely to drop out, but students who worked less were less likely. McNeal found that the beneficial effects of working were curtailed at 7 hours.

3. Students who change schools between 10th and 12th grade are included.

4. We create missing value indicators for each of these variables and test our results to see if they are sensitive to whether or not these variables are included in our analysis, as discussed below. In the linear, logit, and probit regressions indicator variables for each of the missing values are included. In the multinomial logit regressions these indicator variables were omitted for reasons discussed below.

5. This is a composite variable including father's occupation, father's and mother's education, family income, and material possessions of the household. The variable is standardized.

6. Three questions were asked about parent involvement: 1) whether mother (BB046A) or father (BB046B) monitors school work (true/ false); 2) whether parents know what I'm doing (BB046C) (true/ false); and 3) whether father (YB049A) or mother (YB049B) was involved in planning school program (o=no; 1=somewhat or great deal). If parents were not involved in any of the above three areas, we considered the youth to be possibly at-risk.

7. The highest possible score is 3.0.

8. In the survey, the hours were coded into the following categories: '0', '1-4', '5-14', '15-21', '22-29', '30-34', '35 or more'.

9. We do not analyze earnings in 1992 because of discrepancies between the questionnaire and the documentation. The questionnaire asked for monthly earnings for 1992; the CD-ROM documentation describes the variable as 1992 annual earnings, and the mean is around $10,000. It many refer to earnings for the 6th month period before the survey.

10. For 'not at risk' youth the coefficient for working a moderate amount is significant at the .10 level; for 'at-risk' youth it is significant at the .05 level.

11. One could argue that completed years of education control for unobserved factors that affect both high school employment and later outcomes. This would suggest that we should control for completed years of education in 1992 in our regressions for all earlier outcomes. In results not presented but discussed we control for current educational attainment.

12. Utility probably depends more directly on factors such as consumption, leisure, and personal interactions. When behavior is modeled as a function of the prices of these factors and income, the unobserved propensities are often referred to as indirect utilities. We believe that high school employment can affect later wages (the price of leisure) and income. Therefore we do not include income or wages in our regressions. Therefore it might be more correct to say that the V_{in} refer to indirect indirect utilities.

14. Our estimates are obtained using the LIMDEP package (version 6.0). A fuller description of the multinomial logit model can be found in Chapter 3 of Maddala (1983).

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14. The coefficient β_{z_j} is the log of the odds ratio where the ratio is for the odds of making choice j relative to the omitted choice (non-active) for individuals with one value for Z divided by the same odds for individuals with a value of Z one unit lower.

15. These standard errors are calculated using a program available from the authors. We calculate the derivatives at the mean values for the independent variables and hold the predicted probabilities constant when calculating the standard errors.

16. In the HS&B data we found 79, 142, and 156 respondents reporting having no job but having missing values for earnings in 1983, 1984, and 1985 respectively. After 1986 there are no respondents reporting zero jobs but a large (and comparable) increase in the number reporting -1 (a missing value code). We take this as evidence that people with no jobs were coded as -1 after 1986. In addition we assume that people with no jobs had no earnings. Setting earnings to zero when jobs are reported as -1 gives us about 380 extra observations on earnings each year after 1986. Since doing our analysis we have been told that individuals who report being unemployed or out of the labor force in all 12 months of a year were given missing values for number of jobs and earnings because of a skip pattern in the questionnaire.

17. This is true with and without controls. The models in Table 4 are based on MNL regressions without the missing value indicator variables. The OLS models including these indicators produced very similar results. We also ran our MNL regressions for 'at-risk' and 'not at-risk' youth separately and found similar estimated effects of work in 1980 on employment in 1992. In these regressions we tested the effects of adding controls for whether the respondent had children under the ages of 1 and 5 and was a woman. This made almost no difference in our results. Adding controls for whether the respondent had finished high school and college reduced the estimated benefits of working somewhat, but the estimated effect of moderate work remained positive and significant for 'at-risk' and youth and became significant for 'not at-risk' youth, for whom it was only significant at the 10 percent level without these controls.

18. Some analysts (McNeal, 1995, D'Amico, 1984) have found that working a small number of hours in high school lowers drop-out rates. We find that this result only obtains when hours are specified as a continuous variable. When indicator variables are used for each of the seven categories reported in the survey, the lowest categories have insignificant effects and combining them does not yield a significant effect. McNeal (1995) treats hours as a continuous variable and uses the natural log of hours and that variable squared. It appears that he used the midpoint of each category, and set the log of hours to 0 when hours were 0.

19. Not surprisingly, many of our interactions with 'at-risk' status are not significant when we use earnings instead of the log of earnings as the outcome.

20. The estimated effect for 'not at-risk' youth is significant at the 1 percent level.

21. The differences in the effects of working moderate and high hours are not significant for 'at-risk' or 'not at-risk' youth.

22. Our controls included whether the respondent had entered college, finished a non-college degree, or finished a college degree. We also controlled for the number of months in school part-time and number of months full-time from 1988 to 1991 and finally for whether the respondent lives with any children less than 1 and less than 5 and their interactions with whether the respondent was female and living with a partner.

23. This result also holds when we interact being black with our three categories of hours of work in 1980. We also found no significant interactions between work in 1980 and being black or being below the 50th percentile separately.

24. On the other hand, we do find that even after controlling for other factors, blacks are far less likely to be working in 1980 and have substantially lower earnings 1, 2, and 3 years after completing their last degree.

25. He estimates a standard error of over 2,000 dollars on the interaction of working in high school and being black and poor.

26. Curiously when we combine the different categories of hours worked we get a positive and significant effect of working on completed education.

27. Information on GED attainment is not available in the other follow-ups.

28. For 'at-risk' youth mean earnings are around $13,000 and the estimated effect of working moderate hours on the log of earnings is 0.277 suggesting about a $3,600 dollar effect. We can reject a growth differential of -880 dollars over 3 years based on the results in Table 8, suggesting that it would take at least 12 years for the non-workers to catch up with the workers. In results not presented here we perform a similar calculation excluding all cases with missing values and find that we can still reject the hypothesis that the earnings of the at-risk non-workers overcome the earnings of the at-risk moderate workers within 4 years.

29. This is Model 6 from Maddala (1983, pg. 122) and is one version of the more general model discussed by Heckman (1978).

30. When we ran this model for the smaller sample of 'at-risk' youth both estimates were not significant.

31. Foster (1995) controls for all family level factors by looking at the differences between brothers. His standard errors are also very large.

32. In a regression not reported here we find that a GED is associated with about 20 percent higher earnings over being a high school drop-out while having a regular high school degree increases earnings by an additional 10 percent over a GED. These results controlled for additional educational attainment as well as student, family, and school characteristics.

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Table 1 Descriptive Statistics by At-Risk Status		
	At-Risk	**Not At-Risk**
Key Variables	N=1588	N=8490
% School Enroll 82	58.8	83.3
% School Enroll 84	14.4	43.8
% School Enroll 86	11.1	33.7
% School Enroll 92	5.2	10.1
% Employed 82	57.6	62.5
% Employed 84	54.0	56.9
% Employed 86	60.4	64.9
% Employed 92	58.3	72.4
Earnings 1988-91	13,133 (10,711)	17,967 (22,864)
Controls		
Student Characteristics		
Academics		
Test Percentile	23.751	51.800
	(15.982)	(27.249)
Grades	4.302	5.480
	(1.579)	(1.607)
Academic Track	0.170	0.457
Held Back	0.298	0.140
Birth Year	63.154	63.668
	(3.587)	(1.125)

Table 1 Descriptive Statistics by At-Risk Status		
Demographics		
Hispanic	0.230	0.140
Native	0.041	0.025
Asian	0.028	0.036
Black	0.252	0.131
Male	0.555	0.488
Religiosity	1.665	2.348
	(1.833)	(1.835)
Handicap	0.443	0.308
Family Characteristics		
SES	0.748	0.0055
	(0.476)	(0.701)
Spanish spoken at home	0.171	0.104
No Dad	0.339	0.176
Step Family	0.159	0.139
Parent Monitors	0.594	0.917
Parent Knows	0.390	0.852
Parent Plan	0.533	0.934
Parent Education	2.460	3.582
School Characteristics		
% Disadvantaged	27.466	18.291
	(26.707)	(20.328)
% In College	39.456	43.902
	(17.422)	(18.308)
% Non-White	39.374	26.125

Table 1 Descriptive Statistics by At-Risk Status		
	(34.736)	(29.289)
Family Status in 1992		
Lives with Partner	0.545	0.572
Respondent Lives with Child		
Less than One	0.020	0.033
Less than Five	0.289	0.294
Respondent is Female & Lives with Partner and		
Child less than one	0.009	0.017
Child Less than five	0.134	0.168
Completed Education in 1992		
Some Post Secondary	0.367	0.683
Certificate or License	0.146	0.343
Associates or Bachelor's	0.061	0.287
Months in School from 1988 through 1991		
Full-Time	0.974	2.232
	(4.871)	(7.167)
Total Months	1.574	3.914
	(5.967)	(9.319)

Table 1 Descriptive Statistics by At-Risk Status		
Missing Value Dummy Variables		
Student Characteristics		
Test Scores	0.161	0.069
Grades	0.024	0.007
Held Back	0.042	0.028
Religiosity	0.185	0.077
Family Characteristics		
Parent Education	0.382	0.141
Parent Monitors	0.086	0.007
Parent Knows	0.092	0.009
Parent Plans	0.119	0.011
School Characteristics		
% Disadvantaged	0.101	0.091
% In College	0.045	0.034
% Non-White	0.065	0.051

Table 2

Characteristics of Youth by At-Risk Status

Characteristic	At-Risk Youth (N=1588)	Not At-Risk Youth (N=8490)
% SES below 30th percentile	0.81	0.29
% SES below 15th percentile	0.53	0.15
% TEST below 30th percentile	0.64	0.24
% TEST below 15th percentile	0.35	0.12
Parent Involvement	1.52	2.70

Table 3

Distribution of Hours Worked
as Sophomore in 1980,
by At-Risk Status

	0	0-14	15-19	30+	total
At-Risk	61.4	21.1	10.3	7.2	100%
Not At Risk	60.1	24.5	10.6	4.8	100%

Table 4

Estimated Effects of Work in High School on
Later Employment and School Enrollment, by Year and At-Risk Status
With Controls for Student, Family, and School Characteristics

Hours Worked in High School	Outcome = Employment			
1-14	1982	1984	1986	1992
At Risk	0.140**	0.068+	0.046	0.055*
Advantaged-At-Risk	0.051	-0.009	-0.011	-0.05
15-29				
At Risk	0.212**	0.200**	0.099*	0.112**
Advantaged-At-Risk	0.05	-0.107+	-0.033	-0.082+
30 +				
At Risk	0.247**	0.115+	0.096	0.089*
Advantaged-At-Risk	0.01	-0.034	-0.047	-0.123*

Hours Worked in High School	Outcome = School Enrollment			
1-14	1982	1984	1986	1992
At Risk	-0.014	-0.057	0.007	-0.02
Advantaged-At-Risk	0.011	0.029	-0.025	0.019
15-29				
At Risk	-0.055**	-0.133+	-0.024	-0.043
Advantaged-At-Risk	0.003	0.056	-0.023	0.036
30 +				
At Risk	-0.108**	-0.115	0.057	0.052+
Advantaged-At-Risk	0.022	0.042	0.009	-0.052

** = p<.01
* = p<.05
+ = p<.10

Table 5

Estimated Effects of Work in High School on Annual Earnings, by At-Risk Status and Year versus Those Working 0 Hours Controlling for At-Risk Status Only

Hours Worked in 1980	At-Risk Status	1984-5	1986-7	1988-9	1990-1
1-14	At-Risk	1,186+	1,400+	1,755+	2,473**
	Advantaged	762**	521	241	-806
15-29	At-Risk	2,252**	4,356**	4,209**	4,086**
	Advantaged	2,759**	2,609**	1,344	1,172
30+	At-Risk	4,304**	4,674**	4,820**	3,677**
	Advantaged	3,855**	4,380**	2,560+	1,204

Estimated Effects on Fraction Earning Less than $10,000 Per Year

Hours Worked in 1980	At-Risk Status	1984-5	1986-7	1988-9	1990-1
1-14	At-Risk	-0.098**	-0.049	-0.055	-0.047
	Advantaged	-0.043**	-0.009	0.013	0.012
15-29	At-Risk	-0.125**	-0.183**	-0.104*	-0.092*
	Advantaged	-0.170**	-0.121**	-0.073**	-0.042**
30+	At-Risk	-0.170**	-0.132*	-0.159**	-0.119*
	Advantaged	-0.205**	-0.135**	-0.065**	-0.019

** = p<.01
* = p<.05
+ = p<.10

Table 6

Estimated Effects of Work in High School on Natural Log of Earnings (1988-1991), by At-Risk Status versus Those Working 0 Hours, with Controls for Student, Family, and School Characteristics

Estimated Effect on Natural Log of Earnings

Weekly Hours Worked in 1980	1-14	15-29	30+
At-Risk	0.036 (0.064)	0.277*** (.084)	0.155 (0.095)
Advantaged vs. At-Risk	-0.053 (0.069)	-0.178** (0.090)	-0.096 (0.107)

Estimated Effect on Fraction Earning $0 per year

Weekly Hours Worked in 1980	1-14	15-29	30+
At-Risk	-0.042 (0.056)	-0.043 (0.076)	-0.435*** (0.095)
Advantaged vs. At-Risk	0.009 (0.063)	0.023 (0.088)	0.38* (0.195)

*** = $p < 0.01$
** = $p < 0.05$
* = $p < 0.10$

Table 7

Estimated Effects of Work in High School on Completed Education in 1992, by At-Risk Status and Hours Worked, th Controls for Student, Family, and School Charact

Fraction with AA or BA degree

	1-14	15-29	30+
At-Risk	-0.033	-0.04	-0.029
	(0.079)	(0.102)	(0.136)
Advantaged - At-Risk	0.018	0.019	0.132
	(0.081)	(0.105)	(0.143)

Fraction with High School Degree

	1-14	15-29	30+
At-Risk	0.022	-0.012	0.046
	(0.051)	(0.066)	(0.076)
Advantaged - At-Risk	-0.033	-0.028	-0.211*
	(0.063)	(0.080)	(0.093)

Table 8

Estimated Effects of Work in High School on Earnings Growth from 1988 to 1991, by At-Risk Status and Hours Worked, with Controls for Student, Family, and School Characteristics

	1-14	15-29	30+
At-Risk	823	952	864
	(884)	(1145)	(1392)
Advantaged - At-Risk	-1041	-1484	-1150
	(943)	(1230)	(1549)

Table 9

Bivariate Probit Results:
Effect of Work in 1980 on Work in 1982
With Controls for Student, Family, and School Characteristics

Outcome	Variable	Probit Coefficient	Standard Error
1980 Work	1980 Unemployment	-0.011**	0.005
1982 Work	1980 Work	0.531	1.003
	Cov(Ew80,Ew82)	0.000	0.618

Using Unemployment Rate to Test for Selection
Probit Regression of Work in 1982

Variable	Probit Coefficient	Standard Error
1980 Work	0.343**	0.082
1980 Unemp x 1980 work	0.021+	0.011
1980 Unemp x 1980 no work	-0.004	0.010

** = $p < 0.01$
* = $p < 0.05$
+ = $p < 0.10$

Figure 1

Estimated Effects of Work in High School
on Average Annual Earnings from 1988 to 1991,
by At-Risk Status Over Those Working 0 hours,
Controlling for At-Risk Status Only

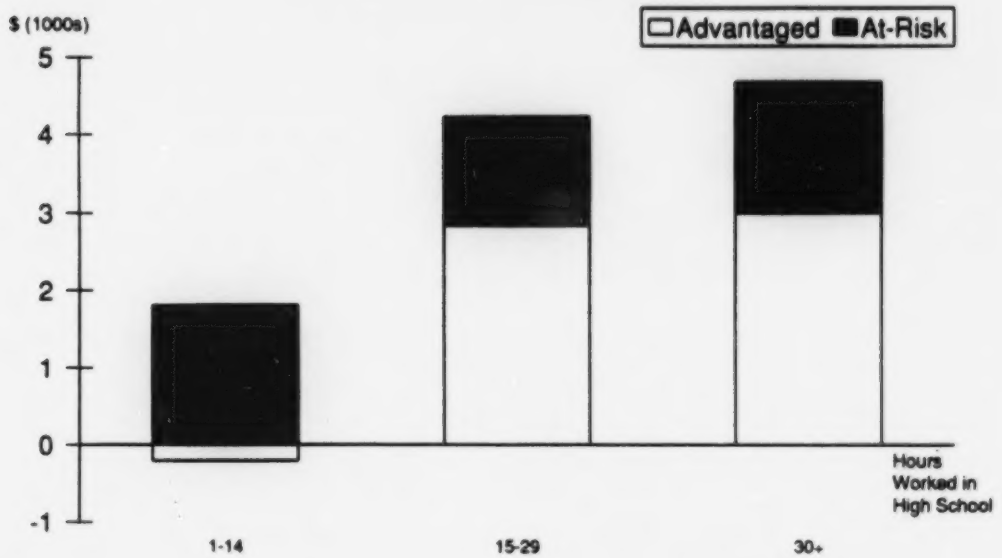

Figure 2

School Enrollment and Employment
in 1982 by Hours of Work in 1980,
by At-Risk Status

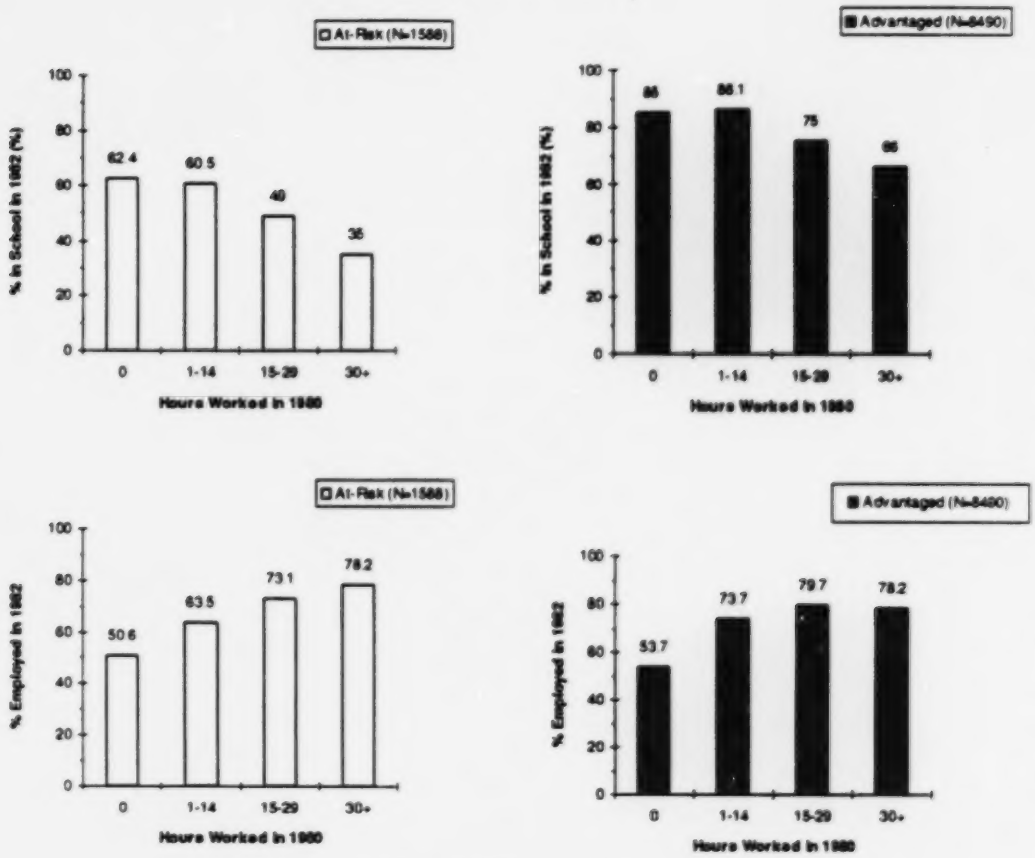

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Figure 3
Employment

Estimated Effects of Work in High School on Later Employment by Year, With Controls for Student, Family, and School Characteristics

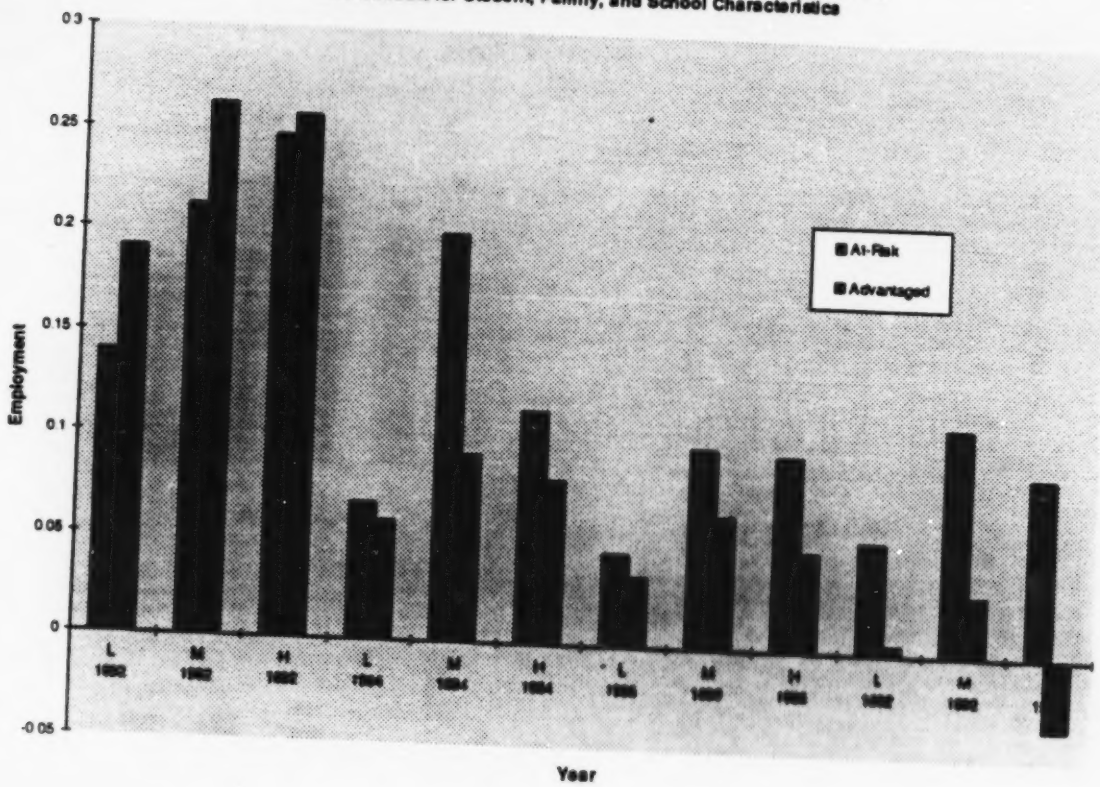

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Figure 4

Enrollment

Estimated Effects of Work in High School on Later School Enrollment by Year, With Controls for Student, Family, and School Characteristics

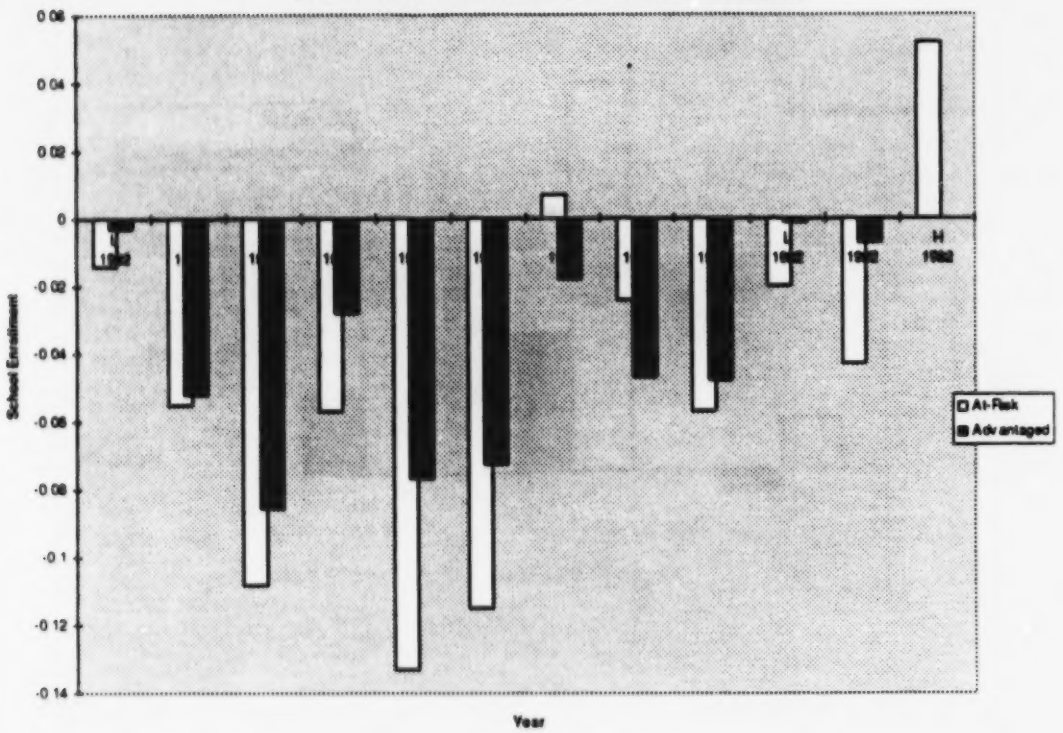

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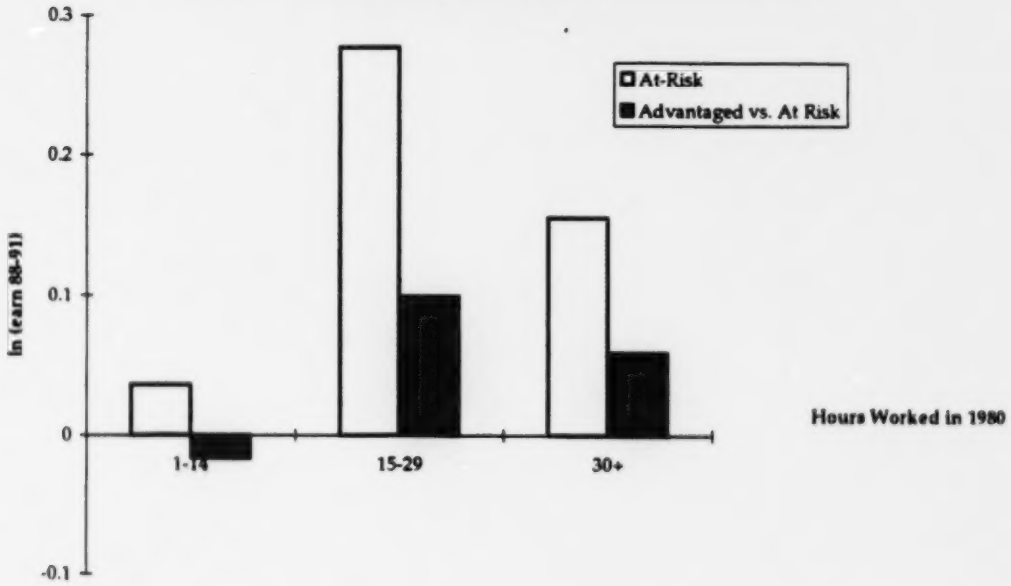
Figure 5

Estimated Effects of Work in High School on Natural Log of Earnings (1988-1991), With Contols for Student, Family, and School Characteristics



Estimated Effects on Fraction Earning $0 per year